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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/685,631	10/15/2003	James T. Beals	EH-11057(03-545)	4989

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EXAMINER	
LIN, ING HOUR	
ART UNIT	**PAPER NUMBER**
1725	

DATE MAILED: 02/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	**Application No.** 10/685,631	**Applicant(s)** BEALS ET AL.	
	Examiner Ing-Hour Lin	**Art Unit** 1725	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 November 2005*.
2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-12,14-19,24 and 25* is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) *1,3-12,14-19,24 and 25* is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a)☐ All b)☐ Some * c)☐ None of:
1.☐ Certified copies of the priority documents have been received.
2.☐ Certified copies of the priority documents have been received in Application No. _____.
3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 5, 18 and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by

Terpay,
~~Schneider;~~

Terpay (col. 1, lines 62+) teaches the claimed casting system of precision molding including molybdenum, tungsten or tantalum refractory metal core (pin) 11 coated with protected oxide layer of alumina (Al_2O_3).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Double Patenting

5. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

6. Claims 1-2, 5-10, 18 and 25 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 and 14 of U.S. Patent No. 6637500. Although the conflicting claims are not identical, they are not patentably distinct from each other because the coatings on the refractory metal core in claims 1, 5-10 and 18 are the same coatings in claims 1 and 14 of U.S. Patent No. 6637500, wherein the protection coating (col. 5, lines 15+) including: silica, alumina, zirconia, chromia, aluminum silicate (mullite).

7. Claims 1, 3-4 and 6-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Schneider or Kirtchik in view of Rubisch et al.

Schneider (col. 2, lines 29+) teaches the claimed casting system of precision molding including molybdenum metal core (wire) coated with protected oxide layer of alumina (Al_2O_3). Kirtchik (col. 1, lines 25+) teaches the claimed casting system including a refractory metal core such as tungsten and molybdenum wire or rod and coated with an oxidation resistant sulfide to provide oxidation resistance and against reaction/dissolution during casting.

Either Schneider or Kirtchik fails to teach the use of the coating comprising aluminum silicate.

However, Rubisch et al (col. 1, lines 22+) teach the use of oxidation protection coating on molybdenum body comprising oxide of aluminum, chromium, zirconium, aluminum silicate or called (mullite) or including 70% SiO_2 + 25% Al_2O_3 in Example 1 or called Al-silicate having 73% SiO_2 + 21% Al_2O_3 in Example 4, and a silicon containing material including a silicide of a metal from Groups IVb to VIb of the periodic table such as zirconium silicide or zirconium silicate ($ZrSiO_4$) or called zircon, molybdenum silicide ($MoSi_2$ or M_5Si_3) for the purpose of effectively improving the molybdenum body with high temperature resistant coatings by forming silica. It would have been obvious to one having ordinary skill in the art to provide either Schneider or Kirtchik the use of coating comprising oxide and a silicon containing material as taught by Rubisch et al in order to improve the molybdenum metal core with high temperature resistant coatings.

8. Claims 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Schneider or Kirtchik in view of Rubisch et al and further in view of Maloney et al.

Either Schneider or Kirtchik in view of Rubisch et al has coating including molybdenum silicide but fails to teach the use of the coating comprising silicon nitride in claim 11 and silicon carbide in claim 12.

However, Maloney et al (col. 4, lines 28+) teach the use of silicon nitride and silicon carbide added to molybdenum disilicide for altering the coefficient of thermal expansion and matching the coefficient of molybdenum fiber for the purpose of effectively reducing thermal cracks. It would have been obvious to one having ordinary skill in the art to provide either Schneider or Kirtchik in view of Rubisch et al the use of silicon nitride and silicon carbide as taught by Maloney et al in order to reduce the thermal cracks of coated molybdenum metal core.

9. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over either Schneider or Kirtchik in view of Lukco et al.

Either Schneider or Kirtchik fails to teach the use of the coating comprising silicon carbide.

However, Lukco et al (col. 4, lines 28+) teach the use of silicon carbide added to coat molybdenum fiber treated by Al-O-N layer for the purpose of effectively reducing thermal cracks. It would have been obvious to one having ordinary skill in the art to provide either Schneider or Kirtchik the use of silicon carbide as taught by Lukco et al in order to reduce the thermal cracks of coated molybdenum metal core.

10. Claims 14 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schneider or Terpay in view of Whitfield et al.

Either Schneider or Terpay fails to teach the use of an intermediate coating layer between the molybdenum metal core and alumna.

However, Whitfield et al (col. 2, lines 37+) teach the use of use of an intermediate layer coating including the use of FCC nickel metals coated on molybdenum core 20 for the purpose of providing protective layers over molybdenum core from diffusion attack solution elements such as oxygen, carbon or nitrogen. It would have been obvious to one having ordinary skill in the art to provide either Schneider or Terpay the use of an intermediate coating layer between the molybdenum metal core and alumna as taught by Whitfield et al in order to protect the molybdenum metal core from oxidation and /or corrosion attack.

10. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schneider or Terpay in view of either Priceman or Nagarajan et al.

Either Schneider or Terpay fails to teach the use of an intermediate coating layer between the molybdenum metal core and alumna and the layer including $MoSi_2$ in claim 15 and (TiN or Si_3N_4) in claim 16.

However, Priceman (col. 3, lines 52+) teaches the use of use an intermediate coating layer 4 between the molybdenum metal core 2 and alumna 6 and the layer including $MoSi_2$ for the purpose of further providing protective layers over molybdenum core. Nagarajan et al (col. 2, lines 37+) teach the use of use of an intermediate layer coating including the use of (TiN or Si_3N_4) coated on molybdenum or tungsten core for the purpose of providing protective layers over molybdenum core from diffusion attack solution elements such as oxygen, carbon or nitrogen. It would have been obvious to one having ordinary skill in the art to provide either Schneider or Terpay the use of an intermediate coating layer between the molybdenum metal core and alumna and the layer including $MoSi_2$ in claim 15 and (TiN or Si_3N_4) in claim 16 as taught by either Priceman or Nagarajan et al in order to protect the molybdenum metal core from oxidation and /or corrosion attack.

11. Claim18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schneider or Terpay in view of Pearsall et al.

Either Schneider or Terpay fails to teach the use of an alumina coated by chemically vapor deposition.

However, Pearsall et al (col. 3, lines 1+) teach the use of use of an alumina coated on a refractory metal substrate by chemically vapor deposition for the purpose of providing protective layers over the molybdenum core from diffusion attack solution elements such as oxygen, carbon or nitrogen. It would have been obvious to one having ordinary skill in the art to provide either Schneider or Terpay the use of use of an alumina coated on an etched surface of a refractory metal substrate by chemically vapor deposition as taught by Pearsall et al in order to protect the molybdenum metal core from oxidation and /or corrosion attack.

12. Claim19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schneider or Terpay in view of Zhao et al.

Either Schneider or Terpay fails to teach the use of top coat (over coat) of aluminide.

However, Zhao et al (col. 3, lines 53+) teach the use of use of top coat (over coat) of aluminide served as diffusion barrier coatings for the purpose of providing protective layers over the oxide coated molybdenum core from diffusion attack solution elements such as oxygen, carbon or nitrogen. It would have been obvious to one having ordinary skill in the art to provide either Schneider or Terpay the use of use of top coat (over coat) of aluminide as taught by Zhao et al in order to protect the oxide coated molybdenum metal core from oxidation and /or corrosion attack

13. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over either Schneider or Kirtchik in view of Atita.

Either Schneider or Kirtchik fails to teach the use of a coating comprising alternating layers of alumina and zirconia.

However, Atita (col. 2, lines 56+) teach the use of a facecoat coating comprising substrate 11 coated by alternating layers of alumina 13 and zirconia 12 for the purpose of effectively increasing creep resistance of the coating. It would have been obvious to one having ordinary skill in the art to provide either Schneider or Kirtchik alternating layers of alumina and zirconia coated on an etched surface of a refractory metal substrate as taught by Atita in order to of effectively increasing creep resistance of the molybdenum core.

Response to Arguments

Applicant's arguments filed 11/23/05 have been fully considered but they are not persuasive. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, either Schneider or Kirtchik fails to teach the use of the coating comprising aluminum silicate.

However, Rubisch et al (col. 1, lines 22+) teach the use of oxidation protection coating on molybdenum body comprising oxide of aluminum, chromium, zirconium, aluminum silicate or called (mullite) including 70% SiO_2 + 25% Al_2O_3 in Example 1 or called Al-silicate having 73% SiO_2 + 21% Al_2O_3 in Example 4, and a silicon containing material including a silicide of a metal from Groups IVb to VIb of the periodic table such as zirconium silicide or zirconium silicate ($ZrSiO_4$) or called zircon, molybdenum silicide ($MoSi_2$ or M_5Si_3) for the purpose of effectively improving the molybdenum body with high temperature resistant coatings by forming silica. It would have been obvious to one having ordinary skill in the art to provide either Schneider or Kirtchik the use of coating comprising oxide and a silicon containing material as taught by Rubisch et al in order to improve the molybdenum metal core with high temperature resistant coatings.

Further, applicant argued that claims 1-2, 5-10, 18 and 25 rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 and 14 of U.S. Patent No. 6637500 are not appropriated because the conflicting claims are not identical. However, they are not patentably distinct from each other because the coatings on the refractory metal core in claims 1, 5-10 and 18 are the same coatings in claims 1 and 14 of U.S. Patent No. 6637500, wherein the protection coating (col. 5, lines 15+) including: silica, alumina, zirconia, chromia, aluminum silicate (mullite).

Conclusion

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ing-Hour Lin whose telephone number is (571) 272-1180. The examiner can normally be reached on M-F (9:00-5:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

I.-H.Lin

2-16-06

KEVIN KERNS Kevin Kerns 2/21/06
PRIMARY EXAMINER